W—113—2018

FACULTY OF SCIENCE

B.Sc. (Fifth Semester) EXAMINATION

OCTOBER/NOVEMBER, 2018

(CBCS Pattern)

PHYSICS

Paper XIII

(Solid State Physics)

(Wednesday, 24-10-2018)   **Time : 10.00 a.m. to 12.00 noon**

Time—2 Hours   *Maximum Marks—40*

N.B. :—   (*i*)   *All* questions are compulsory.

       (*ii*)   *All* questions carry equal marks.

1. Attempt any *four* of the following :   8
   - (*i*)   Define packing factor.
   - (*ii*)   Define Covalent Bond.
   - (*iii*)   Define specific heat of solids.
   - (*iv*)   State Weidemann-Franz's relation.
   - (*v*)   Define co-ordination number.
   - (*vi*)   Define thermionic emission.

2. Attempt any *two* of the following :   8
   - (*a*)   With neat labelled diagram, explain simple cubic Crystal Structure (SC).
   - (*b*)   Explain formation of Ionic Bonding in solids.
   - (*c*)   Explain in detail Face Centred Cubic (FCC) crystal structure.
   - (*d*)   Explain phenomenon of X-Ray Diffraction.

3. Attempt any *one* of the following :   8
   - (*a*)   Explain in detail Translation, Rotation, Reflection and Inversion symmetry operations.
   - (*b*)   Explain powder diffraction method for determination structure of solids.

P.T.O.

4. Write short notes on any *two* of the following : 8

    (*a*) Dulong and Petit's law (Classical theory of specific heat)

    (*b*) Explain in brief escape of electrons from metal.

    (*c*) State any *four* limitations of Debye model of solids.

5. Attempt any *one* of the following : 8

    (*a*) Derive an expression for Einstein's specific heat formula and explain its variation at low and high temperature.

    (*b*) Explain electrical and thermal conductivity of solids and obtain Widemann-Franz relation.